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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/292,132      | 04/14/1999  | SALMAN AKRAM         | MI22-1171           | 3104             |

21567 7590 03/26/2003

WELLS ST. JOHN ROBERTS GREGORY & MATKIN P.S.  
601 W. FIRST AVENUE  
SUITE 1300  
SPOKANE, WA 99201-3828

EXAMINER

MULPURI, SAVITRI

|          |              |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2812

DATE MAILED: 03/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/292,132

Applicant(s)

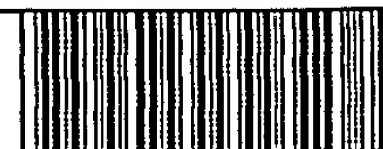
Akram et al

Examiner

Savitri Mulpuri

Art Unit

2812



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Jan 2, 2003
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 51-53, 55-59, and 61-87 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 51-53, 55-59, and 61-87 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Art Unit:

### **DETAILED ACTION**

This action is in response to the applicant's amendment to the claims adding claims 84-87 and arguments filed on January 2/2003.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 51-53 , 76-78, 82-83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al or Oikawa( JP5-102067 from IDS)

Suzuki et al and Oikawa discloses a method of making a device by the following process steps. Providing a substrate, forming gate oxide layer and then annealing in any halogen elemental such as chlorine(Suzuki ) injection technique by Oikawa and forming polysilicon gate electrode.

Both Suzuki et al and Oikawa do not disclose concentration of fluorine . Oikawa even disclose insitu doping of chlorine in gate oxide (see page 5, lines 1-12) in translation document).

Art Unit:

Neither Suzuki nor Oikawa do not mention the concentration of the fluorine in the  
range of  $1 \times 10^{19}$  to  $1 \times 10^{21}$

It would have been obvious to one of ordinary skill in the art to choose halogen element concentration in the oxide of the Suzuki or Oikawa depending on (1) the dose of the dopant for forming drain regions and there by dopant concentration at the interface drain and the substrate and (2) the voltage applied to the drain. (see for example fluorine in gate oxide in Pan et al is  $5 \times 10$

$^{20}/\text{cm}^3$

Normally, change in temperature, concentration, or both, is not patentable modification; however, such changes may impart patentability to process if ranges claimed produce new and unexpected result which is different in kind and not merely in degree from results of prior art; such ranges are termed "critical" ranges, and applicant has burden of proving such criticality; even though applicant's modification results in great improvement and utility over prior art, it may still not be patentable if modification was within capabilities of one skilled in art; more particularly, where general conditions of claim are disclosed in prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. In re Aller et al,

105 U.S.P.Q. 233 CCPA (1955).

Art Unit:

Claims 55-59, 68-75, 79, 81 62-67, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gardner et al.

Gardener et al disclose a method of making a FET device by the following process steps:  
Providing a gate oxide layer on as surface of a substrate; forming a gate electrode on gate oxide layer, wherein side walls of the gate oxide and gate electrode are aligned; forming side walls spacers on the aligned side walls of the gate oxide and gate electrode, wherein side walls having fluorine either by doping or ion implantation; heat-treating the substrate with spacer in nitrogen ambient to suppress hot carrier effect (see col. 3-col. 5). Claim 68 is limited to "forming spacers with chlorine or fluorine only on lateral edge of the gate and not how spacers or formed with respect to gate oxide

After careful review, claims 62-27, 80 were interpreted on the disclosure of Gardner et al.

Gardner et al also discloses "forming sidewall spacers comprising at least one of chlorine and fluorine proximate the opposing edges and directionally over the gate oxide ( see Gardner et al). Gardener et al also discloses a forming spacers containing halogen element opposing edges of the gate and directly elevationally above over the gate oxide, when looked at lateral direction of the gate oxide.

Gardner et al do not disclose (1) concentration of the fluorine in the range of  $1 \times 10^{19}$  to  $1 \times 10^{21}$  / cm<sup>3</sup> and concentration depth not more than 500 angstroms (3) forming gate oxide extending laterally past the lateral edges of the gate.

Art Unit:

It would have been obvious to one of ordinary skill in the art to choose halogen element concentration in the oxide depending on (1) the dose of the dopant for forming drain regions and there by dopant concentration at the interface drain and the substrate and (2)the voltage applied to the drain.

Normally, change in temperature, concentration, or both, is not patentable modification; however, such changes may impart patentability to process if ranges claimed produce new and unexpected result which is different in kind and not merely in degree from results of prior art; such ranges are termed "critical" ranges, and applicant has burden of proving such criticality; even though applicant's modification results in great improvement and utility over prior art, it may still not be patentable if modification was within capabilities of one skilled in art; more particularly, where general conditions of claim are disclosed in prior art, it is not inventive to discover optimum or workable ranges by routine experimentation. In re Aller et al, 105 U.S.P.Q. 233 CCPA (1955).

Applicant's arguments with respect to claims 51-53, 55-87 have been considered but are moot in view of the new ground(s) of rejection.

Art Unit:

.Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Mulpuri whose telephone number is (703) 305-5184. The fax phone number for the organization where this application or proceeding is assigned is (703) 308-7722.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

  
SAVITRI MULPURI  
PRIMARY EXAMINER